

ABSTRACT

This system segments and converts a cryptograph key into two digital optical signals with amplitudes, wavelengths, and initial phases, and an initial aberration (optical path length difference) at a point P where the two digital optical signals meet.

The luminance of light at the interference fringe at point P changes dynamically as the aberration between the two digital optical signals changes, based on the interaction between the two digital optical signals. Using the luminance of light at the interference fringe at point P as a random number, then the ciphertext will be generated by XOR (Exclusive OR) operations between the plaintext and the random number determined by the luminance of light at point P. The invention thus implements a high speed, secure cryptographic system using the random number determined by the luminance.